

THE LIFE-HISTORIES OF SOUTH AFRICAN *COLOTIS ERONE*, *C. IONE*, *C. VESTA* AND *LEPTOSIA ALCESTA* (PIERIDAE)

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Cape Town, South Africa

THE EARLY STAGES of two of these very beautiful Pierids were recorded in full, comparatively recently, apparently for the first time, and they are now being described and illustrated in colour in the present paper.

The first species, *Colotis erone* (Angus), was reared from eggs and larvae procured by the second writer at Umhlanga Rocks, Natal, in 1955 and 1956, and the other species, *Colotis ione* (Godart), from eggs laid by a captive female caught by Mr. T. W. Schofield at the Shongweni Dam, Natal, in 1958; while the more detailed observations and paintings were made from this living material by the first writer in Port Elizabeth, Cape Province.

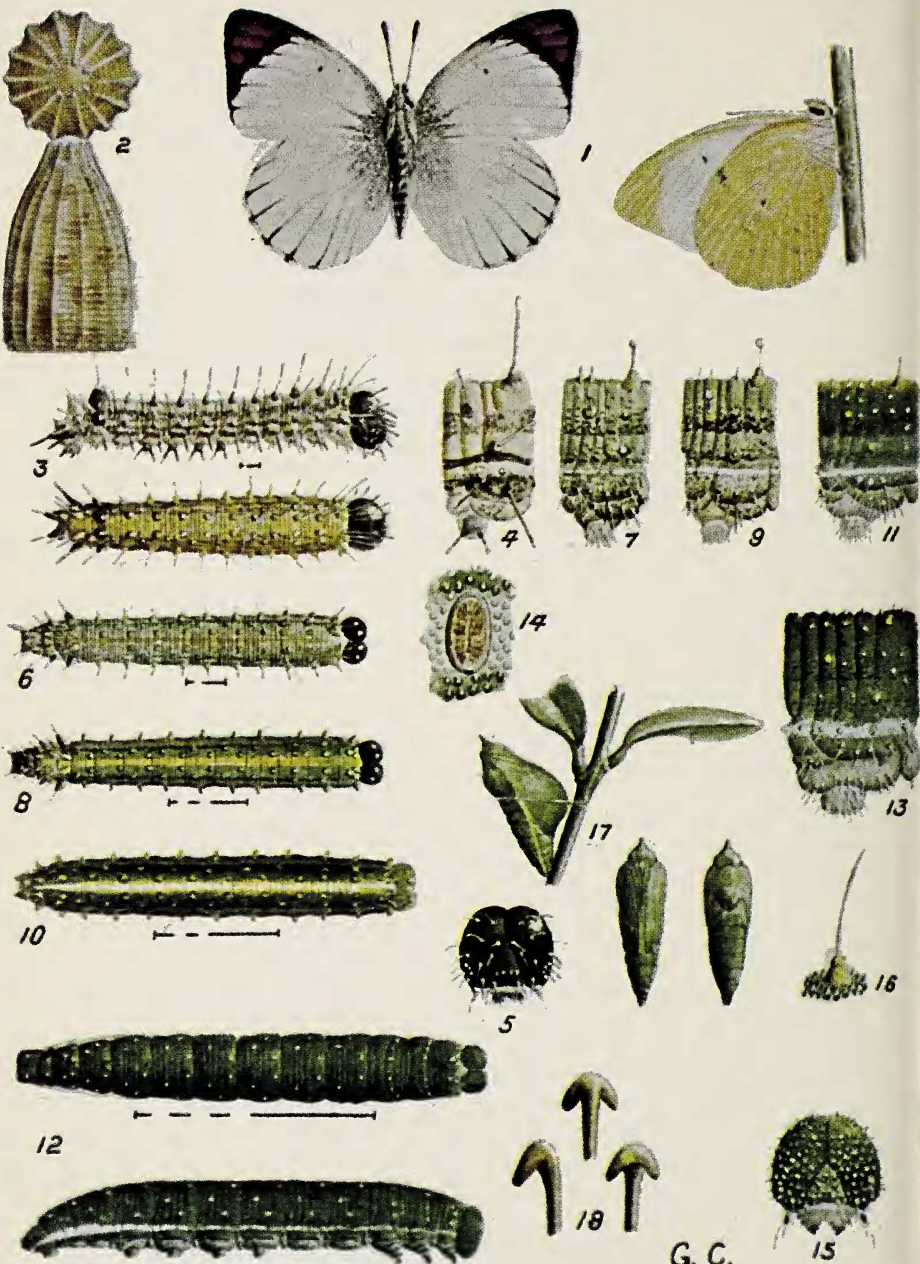
Colotis erone (Angus)

Egg. Eggs are laid singly, generally on a young shoot. They are pale yellow, darkening slightly in time and developing salmon spots, 0.6 mm. in diameter by 0.9 mm. in height and with 14-15 longitudinal ribs, only half of which reach the micropile. These ribs are cross-braced by some 25-28 lesser ribs. Eggs hatch after 4-7 days.

Larva. The larva eats its way out of the top of the egg and devours the discarded shell. It is 1.75 mm. in length on hatching and of a pale yellow colour, and soon develops brown longitudinal stripes. It feeds on the surface of a leaf and grows to 3 mm. in 6-12 days.

In the second instar larvae are pale green with brown mottled stripes and with the ventral parts dirty yellow. They grow to 5.5 mm. in 4 days.

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COLOTIS ERONE (ANGUS)

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In the third instar larvae are of a darker green with firmer brown stripes and with the ventral portions yellow. They grow to 9 mm. in 3-4 days.

In the fourth instar larvae are of a still deeper green and the stripes are of a faint greenish-brown colour, the thin spiracular one of the two former instars still being present. There is a broad white dorsal line (which shows faint development in the previous instar). Larvae grow to 14 mm. in 4-5 days.

In the final instar larvae are green throughout with a thin white spiracular line. They feed on the edge of a leaf, filling the eaten-out gap with their bodies. They grow to 31 mm. in 7 days.

Pupa. The pupa is some 22 mm. in length and is mainly of green shades, to match its surroundings. It is secured in an upright position by cremastral hooks and a girdle. Emergence takes place after some 18 days.

A succession of broods occurs throughout the year, with a distinct seasonal difference both in markings and size.

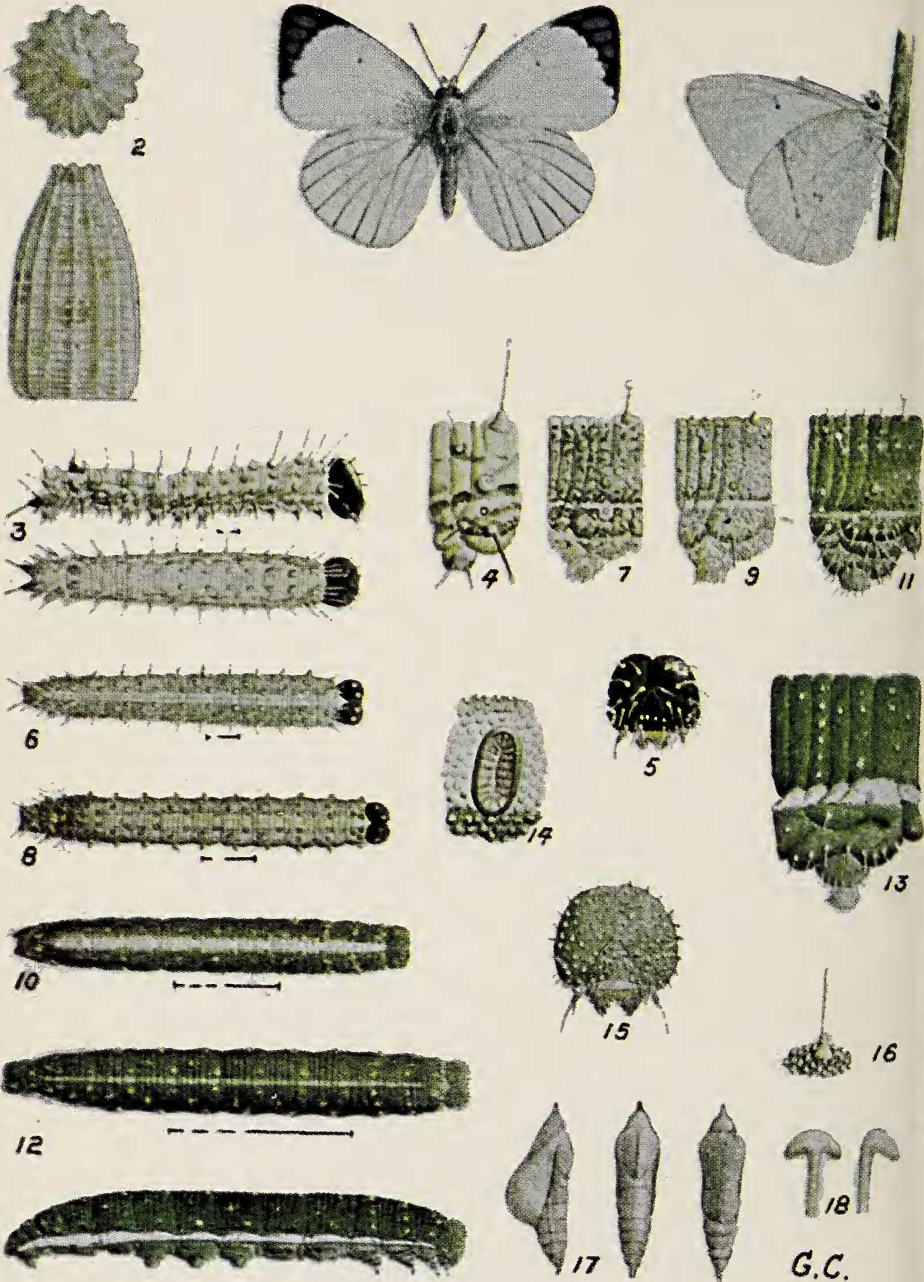
This butterfly has a quick, direct flight only a little distance above the ground, which has been rather aptly described as "jet-propelled" — in contrast to that of so many other Pierids. It is found in the open spaces in the neighborhood of the subtropical coastal forests or in glades and clearings in these forests, but it is also known to occur a short distance from the coast (of Natal) in places showing some approach to savannah country (e.g., at Shongweni Dam) and which, on the whole, are more characteristic as habitats of the following species, *C. ione*.

Food-plant : *Maerua racemulosa* (D.C.) Gilg. and Benn. (Capparidaceae) — *alternatiae* generic name: *Niebuhia*, as recorded originally by Platt (1921) for *Colotis erone*, i.e., *N. pedunculosa* Hochst.

Distribution. The only reliable records for this species appear to be those from or close to the coast of Natal and Pondoland — with a possibly dubious record from Swaziland. Most experienced workers, such as Mr. K. M. Pennington and Dr. van Son, do not now accept the earlier supposed locality records from other territories in Southern Africa, which may have resulted from confusion with *C. ione*.

***Colotis ione* (Godart)**

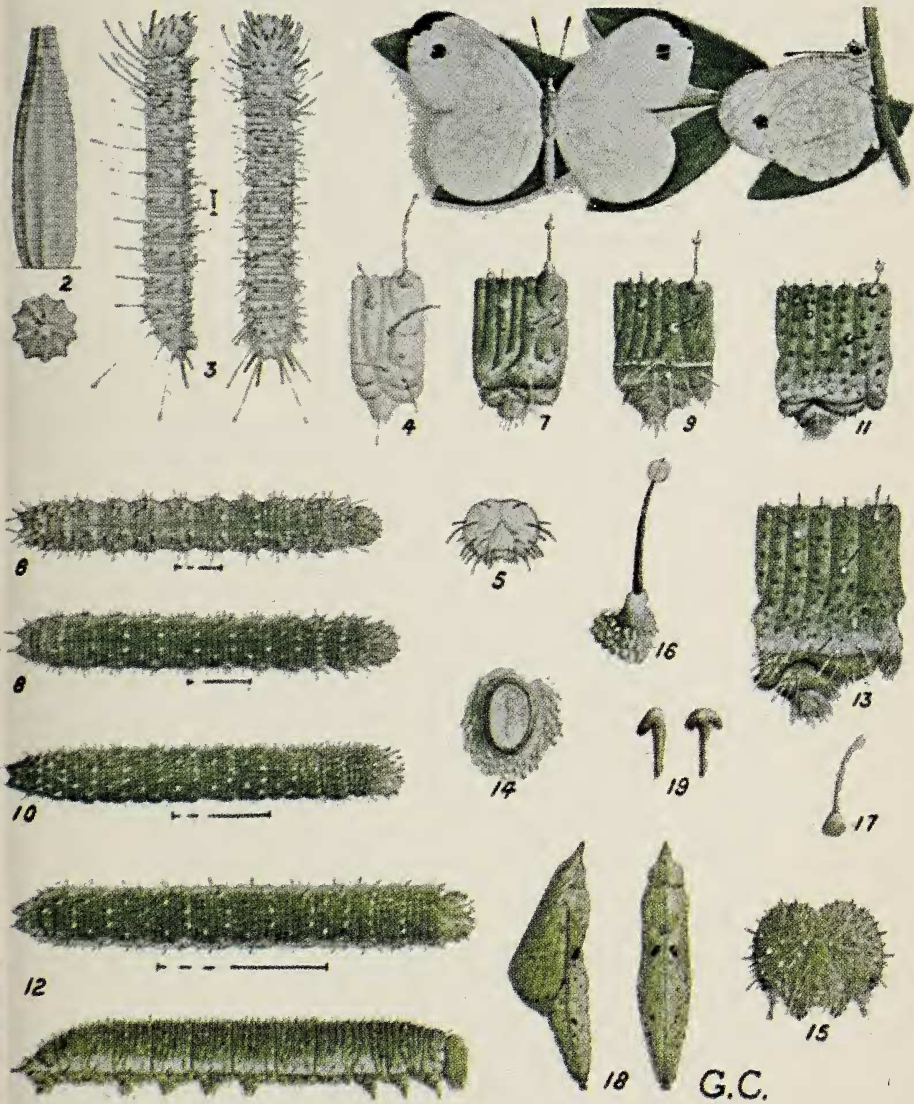
Egg. Eggs are laid singly on a leaf and are white at first but later assume a pale salmon tint with salmon spots. They are 0.45 mm. in diameter and 0.8 mm. in height and have 14-15



COLOTIS IONE (GODART)

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LEPTOSIA ALCESTA (STOLL.)

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longitudinal ribs, only 7-8 of which reach the micropile. The ribs are cross-braced by some 24 finer ribs. The larva emerges from the egg after 9 days.

Larva. The larva eats its way out near the top and the discarded shell is devoured. It is 1.25 mm. in length and of a pale yellow colour, later developing brown irregular lines in the vicinity of the spiracles. It feeds on a leaf's surface and grows to 2.75 mm. in 11 days.

In the second instar larvae are greyish with a whitish dorsal stripe. They grow to 4 mm. in 6 days.

In the third instar larvae are lighter grey, inclining to green, with a thin white spiracular line. They grow to 7 mm. in 6 days.

In the fourth instar larvae are green with white dorsal and pale green spiracular lines, while the anal segments are inclined to brown. They grow to 13.5 — 14 mm. (depending upon the sex) in 8 days.

In the final instar larvae are green with a thin pale-green dorsal stripe and a white spiracular stripe. The primary moles are yellow and very noticeable. Larvae grow to 23-24 mm. in 11 days. (The foregoing measurements applied to specimens which were below average size.)

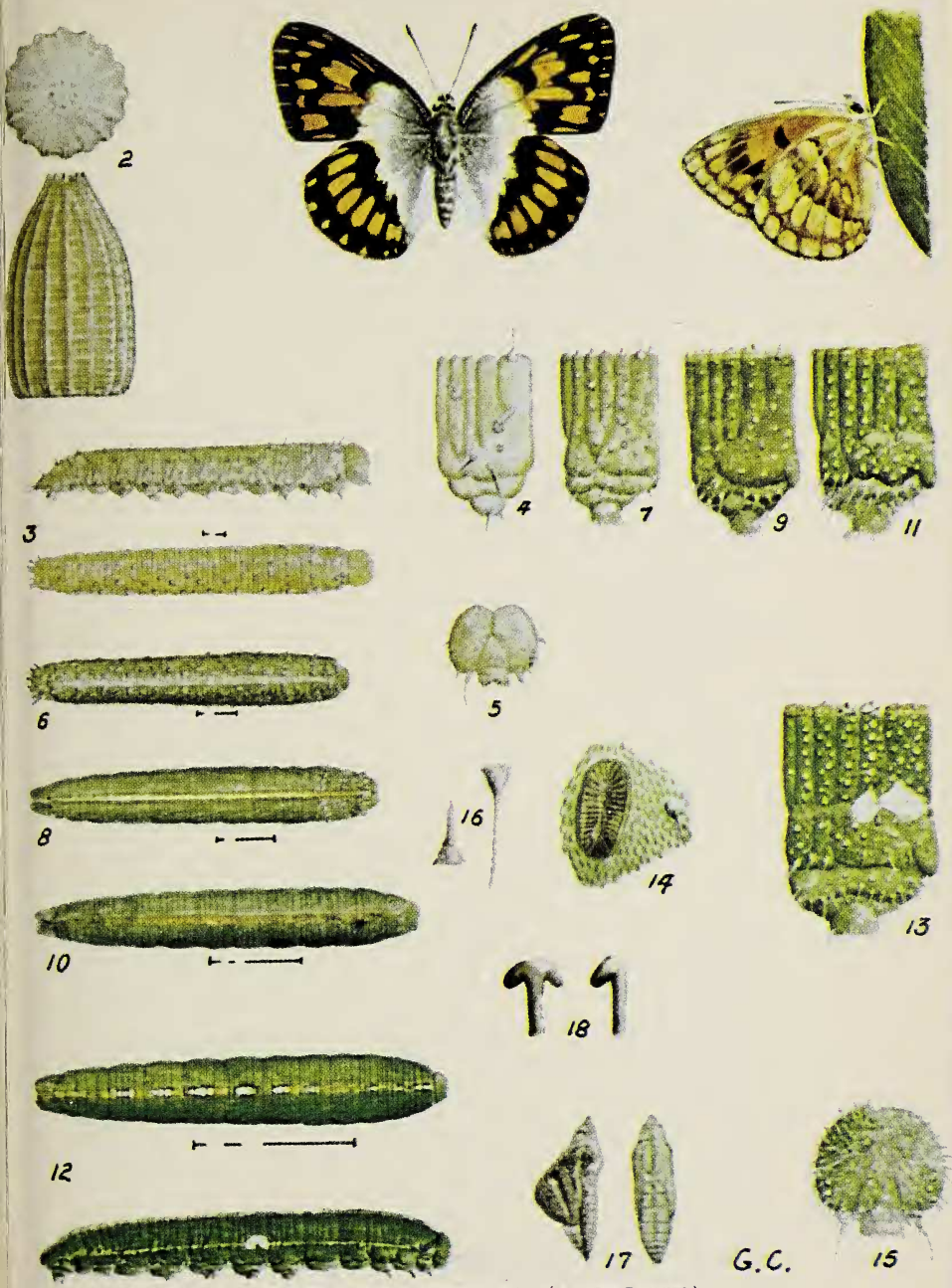
Pupa. The pupa is about 22 mm. in length and is whitish or green in colour. It is secured by cremastral hooks and a girdle, in an upright position. The butterfly emerges after some 18 days.

A succession of broods occurs throughout the year and, as in the previous species, there is noticeable seasonal difference in development of marking, colouring of the underside and size.

The flight is like that of *C. erone*. This species generally inhabits country of savannah types or areas transitional to it, but the butterfly occurs to some extent, anyway, on the Natal coast itself. In the writer's experience, it is decidedly scarce today, in comparison with *C. erone*, on the coast near Durban.

Food-plant : *Maerua racemulosa* (D.C.) Gilg. and Benn. (Cappiariaceae).

Distribution in Southern Africa. Pondoland (Port St. Johns — on the first writer's authority); Natal (from the coast to some distance inland in suitable areas) and portions of Zululand; S.W. Africa; Bechuanaland; N. and N.E. Transvaal; Rhodesia; Mozambique. Presumably, also Swaziland.



COLOTIS VESTA (REICHE)

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THE COMPLETE LIFE-CYCLES of the two species remaining do not appear to have been recorded previously or figures given of all the immature stages and these are therefore now being published, with all the stages represented in colour.

Material for these studies was procured in Natal: that for *Leptosia alcesta* on the coast, at Umhlanga Rocks, by the second author in 1955, and for *Colotis vesta* at Keat's Hill, on the Greytown-Dundee road, by Mr. T. W. Schofield, of Pietermaritzburg, in 1958, while the actual breeding and recording were done at Port Elizabeth, Cape Province.

Leptosia alcesta (Stoll.)

Egg. Eggs are laid singly on young shoots. They are pure white, 1.5 mm. high by 0.4 mm. in diameter and have 10 longitudinal ribs, only 6 of which reach the micropile. These ribs are cross-braced by 28-30 fine ribs. Eggs hatch after 4-6 days.

Larva. The emerging larva eats its way out of the top of the egg and devours the discarded shell. It is 1.5 mm. long and is transparent water-white, the transparency, until it feeds on the leaves, making it difficult to see. It feeds on the edge of a leaf and grows to 3 mm. before moulting, after 6 days.

In the second instar larvae are greenish above and whitish below. They keep to one resting place, though they are not gregarious, and crawl away from it to feed. They grow to 6 mm. in 3 days.

In the third instar larvae are green throughout; they have the same habits as before and grow to 8 mm. in 3 days.

In the fourth instar larvae are of the same green colour but they have more setae. They grow to 12.5 mm. in 3 days.

In the final instar larvae are perhaps a shade darker in colour and there is a faint whitish sub-spiracular stripe. They grow to 22 mm. for male, and 23 mm. for female specimens in 10 days before pupating.

Pupa. The pupa is 15.5-16 mm. in length and is pale green. It is secured to a twig by cremastral hooks and is supported by a girdle. Emergence occurs after 10 days.

There is a succession of broods throughout the year, at any rate in the warm coastal portions of its range.

This delicate species has a very feeble flight and habitually

frequents the tropical or sub-tropical forests and their undergrowth, or at least localities in which the vegetation is sufficient to provide the shade in which it is usually found flitting about in its leisurely and rather restless manner.

Food-plant *Capparis zeyheri* Turcz. (Capparideae).

Distribution in South Africa. Natal (the coastal, or more coastal, zone); N. E. Transvaal; portions of Rhodesia; Swaziland; Mozambique.

***Colotis vesta* (Reiche).**

Egg. Eggs are laid singly on a leaf. They are white when laid but change to a pale yellow, are 0.45 mm. in diameter by 0.75 m.m. in height and there are 16 longitudinal ribs, only 9 of which reach the micropile. The ribs are cross-braced by some 24 small, fine ribs. Some eggs are faintly blotched with pale salmon. Eggs hatch 4 days after being laid.

Larva. The larva, on emergence, is 1.5 mm. long and is pale yellow throughout. It feeds on the younger leaves and grows to 3 mm. in 3-4 days.

In the second instar larvae are pale green with a light dorsal stripe. They grow to 5 mm. in 3 days.

In the third instar larvae are green with a yellow-bordered, whitish dorsal stripe. They feed on the edge of a leaf, occupying the part eaten out, with the dorsal stripe matching the missing edge. Larvae grow to 8 mm. in 3 days.

In the fourth instar larvae are green with a solid yellow dorsal line and a faint, whitish-green spiracular line has developed in this instar. They grow to 12-13 mm. in 3 days.

In the final instar larvae are green, with the dorsal line broken into alternate white and yellow portions, and each white portion thinly edged with brown. The spiracular line has widened into a white patch round the spiracle on segment VII. Larvae will now devour a whole leaf. They grow to 20-23 mm. in 4-5 days.

Pupa. The pupa is some 13.5 mm. in length and there is individual variation in colour from light green to shades of light brown. There is a well defined lateral stripe and the extended wing-case has a diagonal stripe. The pupa is secured by cremastral hooks and a girdle. The butterfly emerges after 6-11 days.

The broods are continuous throughout the year, with seasonal variation noticeable in specimens.

This species is characteristic of certain tracts of country of more or less savannah type with a prevalence of native *Acacia* trees, sometimes interspersed with scattered but not very high bush. The flight is not as rapid as that of some of the other members of its genus.

Food-plant: at least one species of Capparideae.

Distribution in Southern Africa. Natal (excluding, from available records, the southern portion); S.W. Africa; Bechuanaland; N. and N.E. Transvaal; Rhodesia; Mozambique. Presumably, also Swaziland.

Much information pertaining to the two foregoing species, as regards the imagines, may be obtained from the works listed below.

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LEGEND TO THE FIGURES

COLOTIS ERONE

1. Imago, natural size
2. Egg — x 27
3. Larva on hatching
4. 7th Segment, 1st instar — x 60
5. Head, 1st instar — x 30
6. Larva, 2nd instar
7. 7th Segment, 2nd instar — x 30
8. Larva, 3rd instar
9. 7th Segment, 3rd instar — x 18
10. Larva, 4th instar
11. 7th Segment, 4th instar — x 10
12. Larva, final instar
13. 7th Segment, final instar — x 5
14. Spiracle enlarged
15. Head, final instar — x 5
16. Seta, much enlarged
17. Pupa, natural size
18. Cremastral hooks, much enlarged

COLOTIS IONE

1. Imago natural size
2. Egg — x 35
3. Larva on hatching
4. 7th Segment, 1st instar — x 65
5. Head, 1st instar — x 35
6. Larva, 2nd instar
7. 7th Segment, 2nd instar — x 60
8. Larva, 3rd instar
9. 7th Segment, 3rd instar — x 25
10. Larva, 4th instar
11. 7th Segment, 4th instar — x 15
12. Larva, final instar
13. 7th Segment, final instar — x 10
14. Spiracle, enlarged
15. Head, final instar — x 8
16. Seta, enlarged
17. Pupa, natural size
18. Cremastral hook, much enlarged

LEPTOSIA ALCESTA

1. Imago, natural size
2. Egg — x 20
3. Larva on hatching — x 30
4. 7th Segment, 1st instar — x 50
5. Head, 1st instar
6. Larva, 2nd instar
7. 7th Segment, 2nd instar — x 25
8. Larva, 3rd instar
9. 7th Segment, 3rd instar — x 16
10. Larva, 4th instar
11. 7th Segment, 4th instar — x 12
12. Larva, final instar
13. 7th Segment, final instar — x 9
14. Spiracle, enlarged

15. Head, final instar
16. Seta, enlarged
17. ditto
18. Pupa — x 2
19. Cremastral hooks, much enlarged

COLOTIS VESTA

1. Imago, natural size
2. Egg — x 16
3. Larva on hatching — x 30
4. 7th Segment, 1st instar — x 60
5. Head, 1st instar — x 25
6. Larva, 2nd instar
7. 7th Segment, 2nd instar — x 30
8. Larva, 3rd instar
9. 7th Segment, 3rd instar — x 20
10. Larva, 4th instar
11. 7th Segment, 4th instar — x 15
12. Larva, final instar
13. 7th Segment, final instar — x 10
14. Spiracle, enlarged
15. Head, final instar — x 9
16. Setae, enlarged
17. Pupa, natural size
18. Cremastral hooks, much enlarged